Effect of Refrigeration on Hatching of Eggs of the Tasar Silk Moth *Antheraea mylitta* Drury (Saturniidae)

Antheraea mylitta Drury is a semidomesticated Tasar Silk Moth with three generations a year: July-August, September-October and November-December. After the third broad, seed cocoons are preserved in commercial tasar insectaries until mid-June for egg production for first crop. During this period the pupae usually diapause from Winter (December-February) until the following summer (March-June). However, it has been recently observed that from May to mid-June emergence occurs which leads to the production of fertile eggs. Their resultant larvae cannot be reared due to lack of quality food plant leaves and excessive outdoor temperature (39±4°C). The situation requires means to preserve those unseasonal eggs until a favourable rearing time.

Considerable information is available on the effect of low temperature on mulberry (*Bombyx mori*) silkworm eggs (Yakoyama, 1962; Tanaka, 1964; Datta *et al*, 1972; Devaiah & Thontadarya, 1975; Govindan & Narayana Swamy, 1986; Narayana Swamy & Govindan, 1987; Tayade *et al* 1987) and eri (*Phibsamia ricini*) silkworm eggs (Govindan *et al*, 1980, Chowdhury, 1982; Vishwakarma, 1982-83), but no such literature is available on the Tasar silkworm eggs. Consequently an attempt was made to study the effect of refrigeration on hatchability of the eggs of Tasar Silk Moth *Antheraea mylitta* as follows.

29,000 freshly oviposited eggs were collected at random from healthy coupled female moths of the STV (Sukinda tri-voltine) race of *Antheraea mylitta* from Mayurbhanj district of Orissa, India on 22 May 1987. These were kept under room temperature (31 ± 2°C) as a common stock. Every day at 9 A.M., from the first to seventh day following oviposition, 4000 eggs were taken at random from the common stock and divided into four equal parts, each subjected to 24, 48, 72 or 96 hours of refrigeration (10 ± 1°C). Following treatment, the eggs were allowed to incubate at room temperature until hatching. The remaining 1000 eggs served as the control. The hatching percentage of the refrigerated eggs were noted and compared with the control. The experiment was repeated five times during the same period under the same conditions.

Results and summarized in Table 1. The control eggs kept at room temperature (31 ± 2°C) showed 82.44 percent hatch. The refrigeration of 0 day old eggs (fresh) for 24 and 48 hours indicated 82.34 and 82.28 percent hatch respectively, not significantly different from the controls. The same eggs when refrigerated for 72 & 96 hours showed reduction in hatching percentage. Cold treatment to 1 day old eggs for 24 hours also gave satisfactory hatching (82.32%), but in the other treatments, as 1 day old eggs refrigerated for 48, 72 and 96 hours and 2, 3, 4, 5, and 6 day old eggs refrigerated for 24, 48, 72 and 96 hours, there was reduced hatch.

The effect of refrigeration on *Antheraea mylitta* eggs of different ages indicated that the eggs beyond 1 day old were more susceptible to damage at lower temperatures. Vishwakarma (1982-83) observed that *Philosamia ricini* eggs beyond third to fifth day old were more susceptible to low temperature (7 ± 2°C). Datta *et al* (1972) found increasing percentage of mortality in *Bombyx mori* eggs under low temperature refrigeration (5 to 7°C). Govindan *et al* (1980) reported that refrigeration of *Samia cynthia ricini* Boisuduval eggs beyond 5 days old had adverse effect on hatching. Narayana Swamy and Govindan (1987)

Table 1. Mean Hatching percentage of *A. mylitta* eggs refrigerated for different time and at different ages.

Day after oviposition	Age of Eggs (Day)	HATCHING PERCENTAGE			
		24 hours refrigeration	48 hours refrigeration	72 hours refrigeration	48 hours refrigeration.
First	0 (Fresh eggs)	82.34	82.28	74.48	78.14
Second	1	82.32	42.62	24.54	26.86
Third	2	46.30	50.04	72.06	32.82
Fourth	3	72.26	62.74	63.26	46.10
Fifth	4	60.36	62.22	74.10	24.42
Sixth	5	76.38	74.54	56.26	62.38
Seventh	6	72.56	62.12	44.22	60.32

reported that the hatching percentage of *Bombyx mori* eggs of blue stage reduced with increase of refrigeration period from first day (83.70%) to the seventh day (21.60%).

In general, percentage of hatching of *Antheraea mylitta* eggs declined with increase of cold period with few exceptions (Table-1). A similiar trend was also observed by Datta *et al.* (1972) in *Bombyx mori* eggs. Tayade *et al* (1987) concluded that short refrigeration is better to minimise adverse effect on hatching percentage of *Bombyx mori* eggs. Narayana Swany and Govindan (1987) observed that the refrigeration of eggs of pure Mysore race of *Bombyx mori* at blue stage negatively affected yield. Govindan and Narayan Swamy (1986) reported that multivoltine silk worm eggs of *Bombyx mori* at eye spot stage can be refrigerated for one day without decreasing yield.

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A Melanic Aberration of *Philotes sonorensis* (Lycaenidae) from California

The Sonora Blue, *Philotes sonorensis* (Felder & Felder) with ts exquisite color pattern of iridescent light blue, black and white markings, and red spots, is one of California's most beautiful butterflies. Locally common in the nondesert portions of California, it is found in the mountains of Santa Barbara County,

Fig. 1. Aberrant *P. sonorensis*: left, dorsal; right, ventral

Fig. 2. Habitat of *P. sonorensis* in Mission Canyon.
(see text to-spelling it is doubt)